

XLogic Delta-Link MADI HD

MADI Interface for Digidesign® HD Systems

Installation and User Guide

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Safety and Installation Considerations

This section contains definitions, warnings, and practical information to ensure a safe working environment.

Please take time to read this section before installing or using this unit. Please do not dispose of these instructions.

General Safety

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Do not expose this apparatus to rain or moisture.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
- There are no user-adjustments, or user-serviceable items, inside this apparatus. Do not remove the covers of this apparatus; doing so will invalidate your warranty.
- Adjustments or alterations to this apparatus may affect the performance such that safety and/or international compliance standards may no longer be met.
- To reduce the risk of electric shock, do not perform any servicing other than that contained in these Installation Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

Power Safety

- This apparatus is fitted with a universal power supply, approved and certified for operation in this apparatus. There are no user-replaceable fuses.
- A power cord is supplied with this unit. Alternative power cords may be used if rated 2.5A or above and fitted with a 3-pin IEC320 connector and a 3-core cable.
- This apparatus must be connected to an earthed mains outlet. The earth core of the power cord must always connect to the mains supply ground – the earth core forms the safety earth and should not be removed for any reason.
- If an extension power cable or adaptor is used, ensure that the total power rating of the power cable and/or adaptor is not exceeded.
- An external disconnect device is required for this apparatus; a detachable power cord – as used for this apparatus – is a suitable disconnect device.
- An external over-current protection device is required to protect the power wiring to this apparatus. In certain countries this function is supplied by use of a fused plug.
- All power wiring should be installed according to local wiring regulations.
- The mains outlet used for this apparatus should be located nearby and be easily accessible.
- Unplug this apparatus during an electrical storm or when unused for long periods of time.

Installation Notes

- When installing this apparatus, either fix it into a standard 19" rack or place the apparatus on a secure level surface.
- Ensure that no strain is placed on the cables connecting to this apparatus. Ensure also that such cables are not placed where they can be stepped on, pulled or tripped over.
- Do not operate this apparatus whilst it is covered or boxed in any way.
- Do not operate this unit with the covers removed.

1. Introduction

XLogic Delta-Link MADI HD

Congratulations on your purchase of the XLogic Delta-Link MADI HD! Please be assured that it will provide you with many years of reliable service while delivering the pristine audio quality you expect from any Solid State Logic product.

The Delta-Link MADI HD is an elegantly styled, 1U high, rack mountable unit. The front panel design is reminiscent of the rest of the XLogic Alpha-Link range... rather understated in this case: since the unit is controlled from the computer, the only front panel controls are the power switch, the power LED and a lock indicator LED.

Using Delta-Link MADI HD you can hook-up a standalone, MADI compatible multi channel I/O and format conversion unit to a Pro Tools® HD core or Pro Tools® HD Accel card(s). Solid State Logic has a number of such I/O units:

- XLogic Alpha-Link MADI-SX (64 MADI I/O, 12 stereo/24 mono AES/EBU I/O, 24 balanced analogue I/O).
- XLogic Alpha-Link MADI-AX (64 MADI I/O, 24 ADAT I/O, 24 balanced analogue I/O).

The Delta-Link MADI HD is also suitable for applications where Pro Tools® audio hardware is used with third party software packages (e.g. Logic Pro 7).

IMPORTANT: Please register your XLogic Delta-Link MADI HD on our website. This will ensure that you receive notification of future updates and other important information, and that your guarantee is registered. Registration will also make you eligible for technical support.

The Solid State Logic home page is at: <http://www.solidstatelogic.com>

From there you can go to the Support page, which includes links to the Product Registration and Download pages. You can also visit the Frequently Asked Questions (FAQ) area for any questions you might have or to contact tech support.

Reading conventions

Software menus

Where appropriate, to indicate a “path” under a Solid State Logic or Pro Tools® software menu, the following format will be used; menu: **Header | Submenu 1 | Submenu 2 | Submenu 3 | Item.**

Screenshots

The appearance of SSL or Pro Tools® software on your computer screen may be different from the screenshots in this manual. This could be because you are using a different operating system or operating system version or because you are using different display settings, etc.

2. Overview

Front panel



Power switch

This switch is used to power the unit up or down.

Power LED

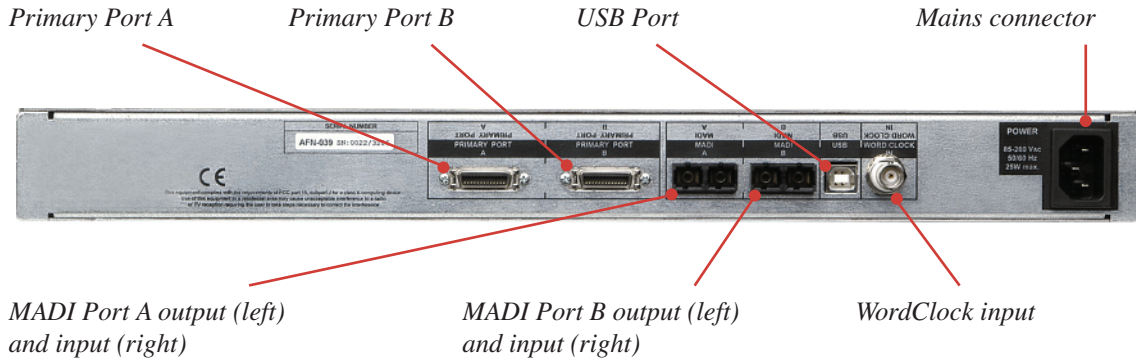
This LED is lit when the Delta-Link MADI HD is switched on.

Lock LED

This LED indicates that a WordClock signal is received:

- It is lit when the Delta-Link MADI HD is receiving a stable signal at the required sample rate.
- It flashes slowly when the Delta-Link MADI HD is receiving a stable signal at an incorrect sample rate. (See Section 5.)
- It flashes quickly when the Delta-Link MADI HD is receiving no signal, an unstable signal, or a signal at a sample rate that falls outside the acceptable boundaries.

Rear panel



Primary Port A / Primary Port B

Each Pro Tools® HD port provides 32 input and output channels, regardless of sample rate.

MADI A / MADI B

The two MADI ports provide up to 64 input and output channels, depending on sample rate. Both MADI interfaces are fibre optic using SC-type connectors; we offer a separate external MADI coaxial to optical converter solution to interface Delta-Link MADI HD into coaxial systems.

USB

The USB interface can be used to control various settings of the Delta-Link MADI HD hardware and to update the internal firmware. This interface is USB 1.0 compliant and uses a Style-A USB connector.

WordClock In

This input must be used to supply a clock reference signal to the Delta-Link MADI HD.

Power

The unit is powered by an internal, auto-switching power supply. The connector is an IEC 320 type.

3. Installation

The Delta-Link MADI HD package includes:

- The Delta-Link MADI HD unit.
- 2 of 0.9m (35") DigiLink cables.
- The mains connection cable.
- This manual.

NOTE: The maximum allowable length of cables required to connect the Digidesign® cards to the Delta-Link MADI HD (DigiLink cables) varies as follows according to the sample rate being used:

- 48 kHz operation: 1.8m (70")
- 96 kHz operation: 0.9m (35")
- 192 kHz operation: 0.45m (18")

If required, Delta-Link MADI HD can be rackmounted. It occupies 1U of rack space in a standard 19-inch rack.

It is assumed that your Pro Tools® HD system is already installed in the host computer (Windows PC or Mac OS X).

1. In a typical setup, connect Primary Port A of the Delta-Link MADI HD to the Primary Port of your HD Core card and Primary Port B of the Delta-Link MADI HD to the Primary Port of your first HD Accel card via DigiLink cables supplied. Technically, any Primary Port of the Delta-Link MADI HD is compatible with any Primary Port of a Pro Tools® HD system, however, connecting Primary Ports A and B of the Delta-Link MADI HD to consecutively numbered Primary Ports of the Pro Tools® HD system is preferable in order to maintain clarity when working in the I/O Setup page of the Pro Tools® software.

WARNING!

Do not connect or disconnect the Delta-Link MADI HD to/from the Pro Tools® cards or power cycle the unit while the Pro Tools® software is running. Doing so will loose all interface settings, recovery from which will require each option to be toggled on the Pro Tools I/O set up page – refer to Section 6.

2. Connect a suitable Word or Frame clock source to the WordClock input at the rear of the Delta-Link MADI HD. (*see overleaf*)
3. Connect the mains cable to the mains connector of the Delta-Link MADI HD.
4. External devices may now be connected to the MADI inputs and outputs.
5. Power up the computer that hosts your Pro Tools® system, and power up the Delta-Link MADI HD (using the power switch on the front panel).

4. Synchronization

Pro Tools® HD card

The Pro Tools® HD card is designed to operate as a Clock Slave, locking to a clock reference signal provided by the audio unit connected to its primary port. The interface unit can define the sample rate internally, or can itself be synchronized to an external reference signal (e.g. WordClock).

Whenever the user selects a sample rate setting in the PC or Mac software, the corresponding command is sent to the interface unit.

Delta-Link MADI HD

The Delta-Link MADI HD, like the Pro Tools® HD card, is designed to operate as a Clock Slave. Once the card and Delta-Link MADI HD are connected together, they can be seen as a unit requiring an external clock reference signal. However, this unit now has MADI ports, instead of the “Digital and Analogue” connections to other devices provided by Pro Tools® interfaces.

Although a reference signal is embedded in the Primary port, the MADI connection requires a separate WordClock signal. Therefore, the Delta-Link MADI HD is equipped with a WordClock input connector.

Depending on the type of unit that is connected to the MADI port, the sample rate will no longer change automatically when a setting is selected in the PC or Mac software (because there is no command channel). Therefore, the sample rate must be set manually at both ends (in the Pro Tools® software *and* on the hardware connected to the MADI port).

WordClock / FrameClock

The WordClock input can translate WordClock or FrameClock to the required Sample Rate. The “LOCK” LED on the front panel indicates reception of a stable signal.

NOTE: When a “multiplexing” mode is used for digital audio transfers, the frame rate of the audio clock is equal to the audio sample rate at up to 48kHz, half of the audio sample rate at up to 96kHz or a quarter of the audio sample rate at up to 192kHz. The term “FrameClock” denotes an audio clock signal that is proportional but not always equal to the sample rate, therefore:

- *At 44.1kHz, 88.2kHz or 176.4kHz, the frame rate is 44.1kHz.*
- *At 48kHz, 96kHz or 192kHz, the frame rate is 48kHz.*

NOTE: To understand this topic fully, it is important to read the AES MADI specification – AES 10 –2003 (www.aes.org).

5. Sample Rates and I/O Mapping

High Speed and SMUX modes

- Sampling frequencies up to 48kHz are designated as being in the “NFS range” (from NFs, Normal Frequency sampling).
- Sampling frequencies above 48kHz and up to 96kHz are in the “DFS range” (from DFs, Double Frequency sampling).
- Sampling frequencies above 96kHz and up to 192kHz are in the “QFS range” (from QFs, Quadruple Frequency sampling).

At high sample rates (in the DFS and QFS ranges), the MADI interface can operate in either of two modes; High Speed or SMUX:

DFS range (88.2kHz to 96kHz)

The MADI interface can operate in High Speed or SMUX2 modes. In High Speed mode the MADI-embedded reference signal has a frequency of 88.2kHz to 96kHz. In SMUX2 mode, the frequency is 44.1kHz to 48kHz.

QFS range (176.4kHz to 192kHz)

The MADI interface can operate in High Speed or SMUX4 modes. In High Speed mode, the MADI-embedded reference signal has a frequency of 176.4kHz to 192kHz. In SMUX4 mode, the frequency is 44.1kHz to 48kHz.

NOTE: To understand this topic fully, it is important to read the AES MADI specification – AES 10 –2003 (www.aes.org).

I/O mapping and Sample Rate range

NFS range (44.1kHz to 48kHz): 64-48 “normal” mode

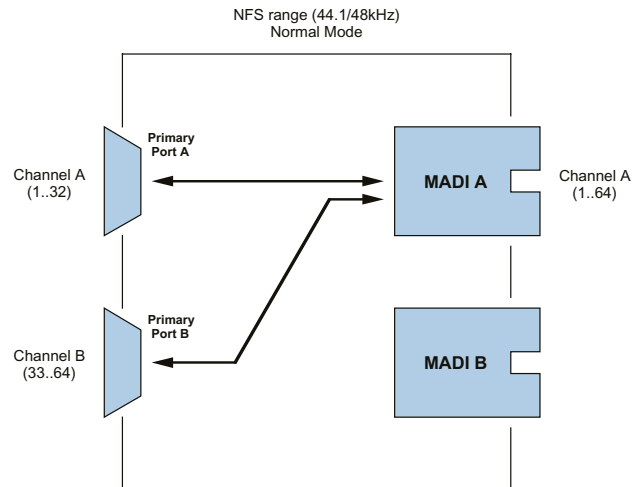
Two Primary Ports interact with one MAD I Port.

Primary Port A, channel 01 ↔ MAD I Port A, channel 0

Primary Port A, channel 32 ↔ MAD I Port A, channel 32

Primary Port B, channel 33 ↔ MAD I Port A, channel 33

Primary Port B, channel 64 ↔ MAD I Port A, channel 64



NOTE: The MAD I Port B output signals duplicate the MAD I Port A output signals, but the MAD I Port B inputs are not connected internally to the Primary Ports in this mode.

NFS range (44.1kHz to 48kHz): 64-48 “special” mode

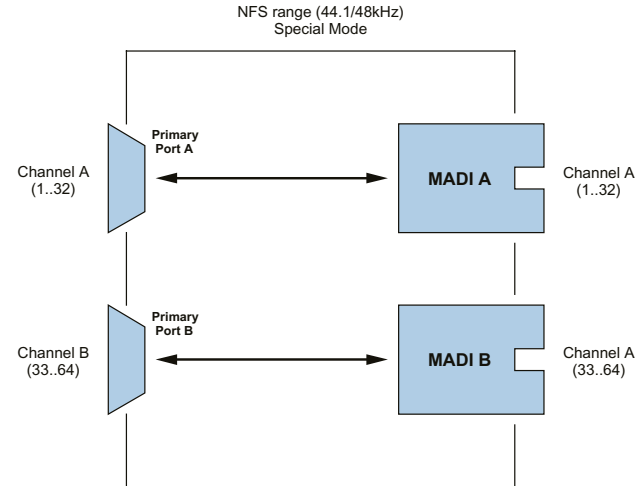
Two Primary Ports interact with two MADI Ports.

Primary Port A, channel 01 ↔ MADI Port A, channel 01

Primary Port A, channel 32 ↔ MADI Port A, channel 32

Primary Port B, channel 33 ↔ MADI Port B, channel 33

Primary Port B, channel 64 ↔ MADI Port B, channel 64



NOTE: The 64-48 special mode must be selected remotely via software. (For Pro Tools[®] see the information on page 19 and table on page 20)

NOTE: This special mode is especially suitable for interfacing with the SSL Alpha-Link range of audio interfaces: two Alpha-Link MADI audio interfaces can be connected to one Delta-Link MADI HD, providing 48 analogue input/output channels and 16 digital input/output channels (AES/EBU or ADAT) at 96kHz.

DFS range (88.2kHz to 96kHz): 64-96 mode

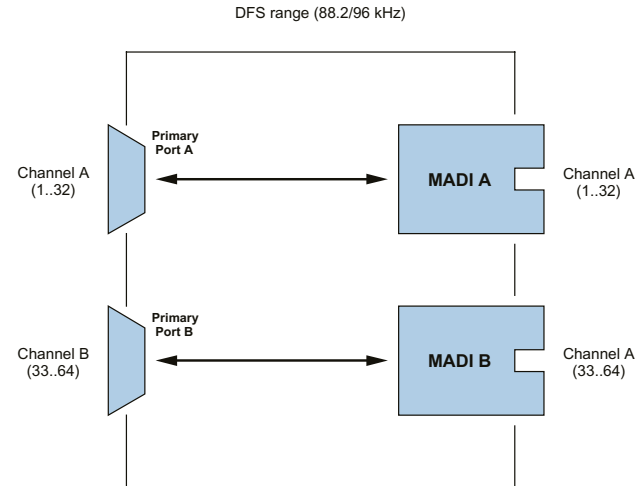
Two Primary Ports interact with two MADi Ports.

Primary Port A, channel 01 ↔ MADi Port A, channel 01

Primary Port A, channel 32 ↔ MADi Port A, channel 32

Primary Port B, channel 33 ↔ MADi Port B, channel 33

Primary Port B, channel 64 ↔ MADi Port B, channel 64



QFS range (176.4kHz to 192kHz): 32-192 mode

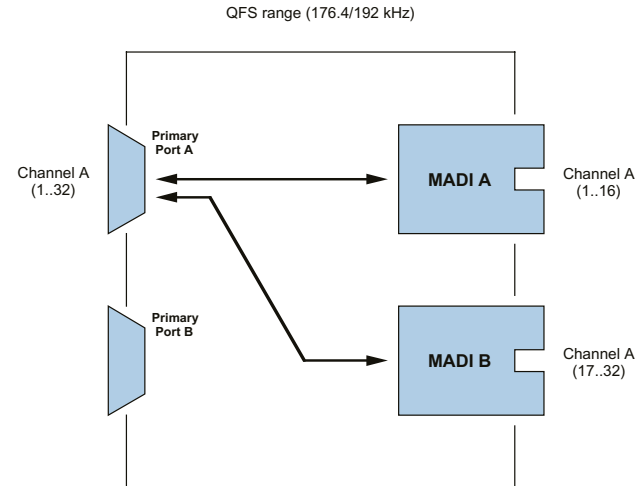
One Primary Port interacts with two MADIs Ports.

Primary Port A, channel 01 ↔ MADI Port A, channel 01

Primary Port A, channel 16 ↔ MADI Port A, channel 16

Primary Port A, channel 17 ↔ MADI Port B, channel 17

Primary Port A, channel 32 ↔ MADI Port B, channel 32



6. Pro Tools® Software

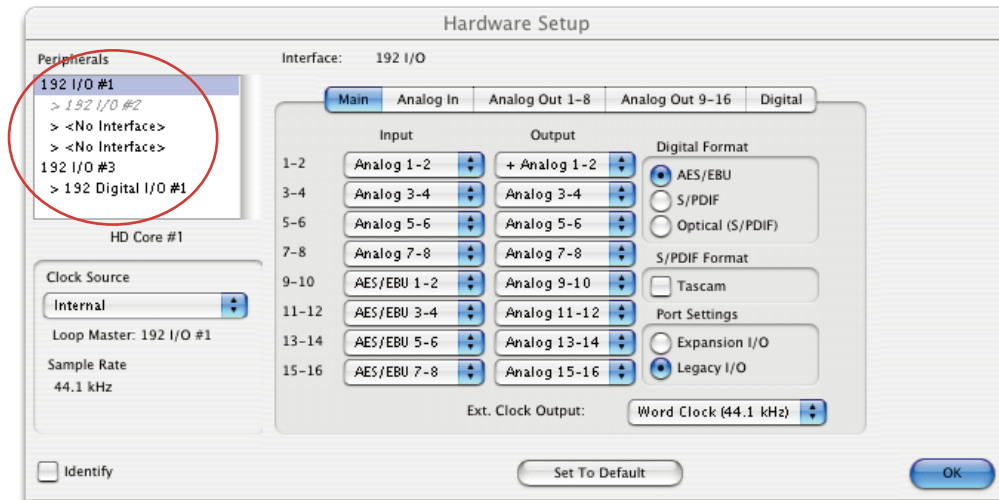
General information

The Delta-Link MADI HD can work with Pro Tools® HD systems running on a Windows PC or Macintosh OS X computer.

Using the Delta-Link MADI HD with the Pro Tools® software is generally straightforward. However, there are a few points to be aware of:

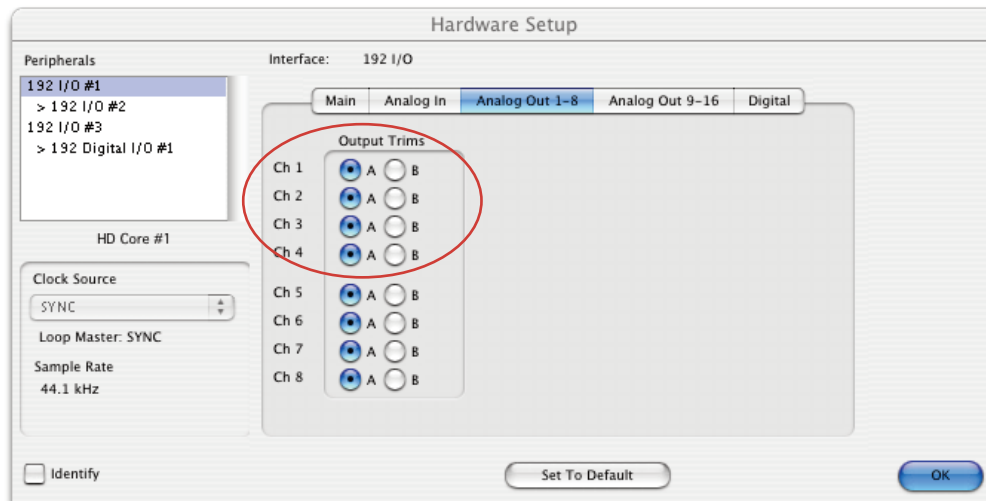
- The Delta-Link MADI HD appears in the Pro Tools® software as four Digidesign® 192 I/O units, except when operating at 176.4 or 192kHz, in which case it appears as two Digidesign® 192 I/O units.
- The MADI inputs and outputs appear in the Pro Tools® software as Analogue or Digital (AES/EBU or ADAT) inputs and outputs belonging to these four Digidesign® 192 I/O units. Therefore, you will not find any MADI inputs or outputs listed in the Hardware Setup page of the Pro Tools® software (select **Setup | Hardware**). Please use the inputs and outputs that are listed, regardless of their denomination – *they are really your MADI inputs and outputs* – and do not select “None”.

The screenshot below was made using a Pro Tools® HD system with a single Delta-Link MADI HD which appears as a set of 192 I/O peripherals (see below, top left). All the inputs and outputs listed belong to this single unit.



Remote control of Delta-Link MADI HD settings

Some Delta-Link MADI HD system settings can be controlled via the Analog Out tab of the Pro Tools® software's Hardware Setup window (select **Setup | Hardware**).



In the Hardware Setup window, the “Output Trim” settings are irrelevant to the Delta-Link MADI HD because its inputs and outputs are all digital. Therefore, they can be used to set various Alpha-Link parameters as follows:

Channel Number	Parameter	If “A” is selected	If “B” is selected
1	Number of MADI channels	56/28/14	64/32/16
2	MADI NFS mode	Normal	Special
3	MADI DFS/QFS mode	SMUX	High Speed
4	WordClock input	WordClock	FrameClock (48kHz /44.1kHz)

The 56/28/14 channel MADI mode of the Delta-Link MADI HD does not currently support varispeed operation whilst the 64/32/16 channel MADI mode for any unit can only run at fixed rate. In both modes the Delta-Link MADI HD unit’s tolerance for sample rate variation is $\pm 0.5\%$.

Known issues

Start up errors

When the Pro Tools® software starts up, it uses the settings defined during the previous session, e.g. number and type of Audio Interfaces, I/O setup, etc.

If you have used a Legacy Audio Interface (defined through menu: **Setup | Hardware**), and then replaced its current Audio Interfaces with the Delta-Link MADI HD, the Pro Tools® software will display the following error message: “*DAE error -1125 was encountered*”. This is because the Legacy Audio Interface cannot be detected anymore. After clicking “OK”, the ProTools® software will close without allowing you to change the Hardware setup!

Solution 1. (Mac or PC)

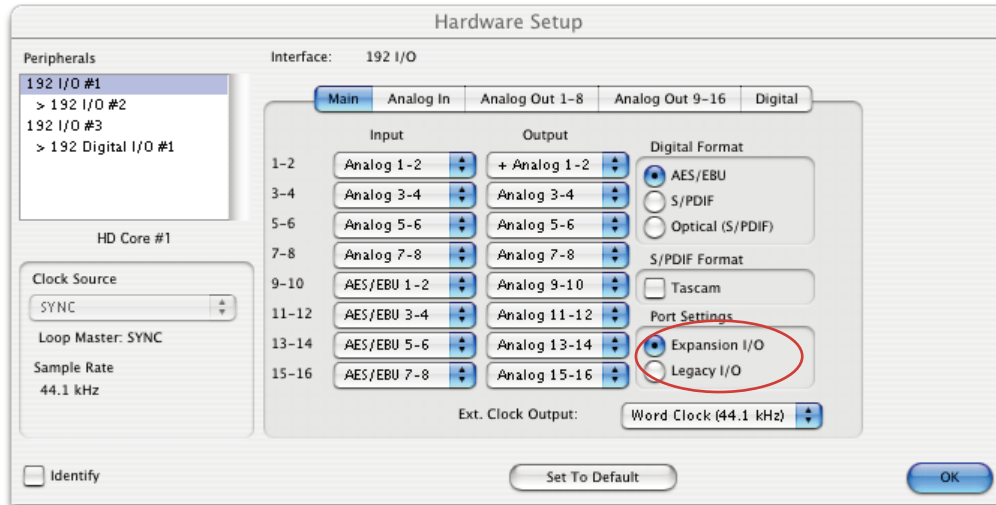
- An easy way to get around this problem is to startup ProTools® with the Delta-Link MADI HD switched OFF. The following message will eventually be displayed: “*Unable to find an Audio Interface attached to..*”. At this point, power up the Delta-Link MADI HD and click “OK”. Pro Tools® will then continue its start up procedure.

Solution 2. (Mac Only)

- Another way to solve this problem is to delete the “DigiSetup.OSX” file and the “DAE prefs” folder in the “Library/Preferences” folder. This will force Pro Tools® to start up using a default configuration (48kHz, limited “Voices”, no Hardware knowledge...)

For either solution, now go to menu: **Setup | Hardware** and make sure all Legacy Interfaces are removed from the Peripherals list (see over leaf).

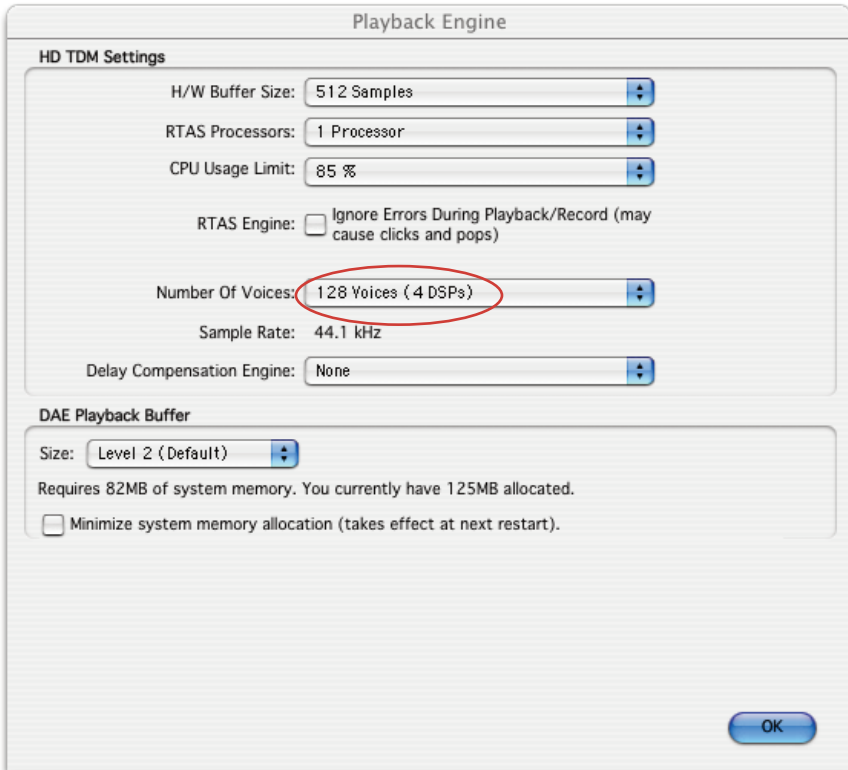
The best way to ensure all Legacy Interfaces are removed is to click the name of a Legacy Audio Interface (e.g. 882/20 or 888/24) and to select “No Interfaces” from the “Interface” drop down box. After the Legacy Interfaces have been removed, select the 192 I/O device, click the “Main” tab and select “Expansion I/O” in the “Port Settings” section. As a result, you will see the second 192 I/O device appearing in the “Peripherals” list.



Playback Engine

The Delta-Link MADI HD provides up to 64 input and output channels. Therefore, the number of voices for the Playback Engine may need to be increased.

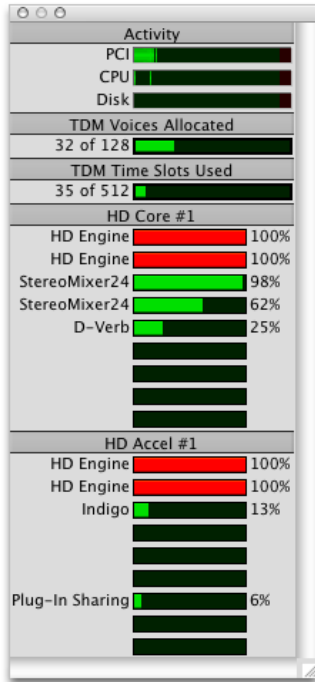
For instance, in order to playback and record 64 tracks simultaneously at 96kHz, go to menu: **Setup | Playback Engine** and select “128 voices”.



7. Troubleshooting

System Resources

The system resource usage can always be checked in the Pro Tools® software under menu: **Window | System Usage:**



Firmware Updates

The Delta-link MADI HD features a USB connector on the back panel to allow for firewire updates or settings modifications.

When a new firmware update is released, an update utility will be available from the downloads section of the Solid State Logic Support Website.

NOTE: The interface is USB 1.0 compatible only.

NOTE: Please do not switch the unit off, disconnect the USB cable or switch off the controlling computer whilst upgrading the firmware. Doing so may leave the Delta-Link MADI HD in an unusable state.

Technical support

If you encounter problems that you cannot solve, please check out our online knowledge base at <http://solid-state-logic-en.custhelp.com> for trouble shooting tips or to get assistance from our technical support team.

Symptoms	Possible solutions
<p>The Delta-Link MADI HD is not detected by the software.</p>	<p>Check that the Delta-Link MADI HD is connected to the mains supply and that the Power switch is in the On position (the Power LED should be lit). Check the condition of the mains cable. Check that the Delta-Link MADI HD is connected to the Pro Tools® HD cards via suitable DigiLink cables and check the condition of these cables.</p>
<p>There is no sound or there is noise. The Lock LED flashes.</p>	<p>Check that the Delta-Link MADI HD is receiving a suitable WordClock or FrameClock signal compatible with the Sample Rate selected in Pro Tools®.</p>
<p>The Delta-Link MADI HD is recognized by the Pro Tools software and the Lock LED is lit. However, there is no sound.</p>	<p>Check the MADI connections and the condition of the MADI cables. In particular, make sure that the MADI inputs of the Delta-Link MADI HD are connected to MADI outputs and vice versa of the other device(s). Please note that MADI cables are sometimes marked “A” at one end and “B” at the other end, which can be confusing and sometimes results in two MADI inputs or two MADI outputs being interconnected by mistake.</p>
<p>Bad audio.</p>	<p>This may be caused by a MADI mode mismatch between the Delta-Link MADI HD and the device connected to its MADI ports (e.g. a unit from the SSL Alpha-Link MADI series). The MADI format allows either 56/28/14 or 64/32/16 input/output channels, depending on the selected Sample Rate. Devices connected via MADI must use the same MADI mode! Varispeed operation is not currently supported – changing the settings of the other device is necessary. (For an SSL Alpha-Link MADI interface, please refer to the corresponding manual.)</p>

8. Specifications

Physical *

Depth	175mm / 7"	<i>casing only</i>
Height	44.5mm / 1.75" (1 RU)	
Width	438mm / 17.25" 482mm / 19"	<i>casing only</i> <i>inc' rack ears</i>
Weight	2.2kg / 5 pounds	
Power	< 15 Watts	
Boxed size	320mm x 550mm x 80mm 12.75" x 21.75" x 3.25"	
Boxed weight	2.7kg / 6 pounds	

* All values are approximate

Environmental

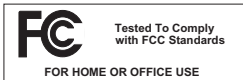
Temperature	Operating:	+5 to 30 deg. C
	Non-operating:	-20 to 50 deg. C
	Max. gradient:	15 deg. C/hour
Relative Humidity	Operating:	20 to 80 %
	Non-operating:	5 to 90 %
	Max. wet bulb:	29 deg. C
	(non-condensing)	
Vibration	Operating:	< 0.2 G (3 – 100Hz)
	Non-operating, power off:	< 0.4 G (3 – 100Hz)
	Shock	Operating:
	Non-operating:	< 10 G (10ms max.)
Altitude (above sea level)	Operating:	0 to 3000m
	Non-operating:	0 to 12000m

Connections

Power	IEC320 3-pin connector, 100 – 240 Vac, 50 – 60 Hz
Digital I/O	
Primary Port A, Primary Port B	26-pin Hirose DXM series socket
MADI A	
MADI B	Twin SC type chassis sockets Glass Multimode Fibre: 50/125 μ
Control	
USB	Standard B-type chassis socket.
WordClock	75 Ω BNC, Zin = 75 Ω , 3V3/5V TTL compatible.

Performance

Quantisation	24bit, fixed point
Sample Rates	44.1kHz
	48kHz
	88.2kHz
	96kHz
	176.4kHz
	192.kHz <i>(all at $\pm 0.5\%$)</i>



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This

equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

Instructions for Disposal of WEEE by Users in the European Union



The symbol shown here is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

Standards Conformance

This apparatus fully conforms with the current protection requirements of the European community council directives on EMC and LVD.

Warranty

Pursuant to the Solid State Logic Terms and Conditions under European consumer law the purchaser has full statutory warranty rights for two years from the date of delivery of the product. The warranty is valid only in those Member States of the European Union (EU) who have adopted the applicable EU law into their national legislation. The applicable national legislation governing the sale of consumer goods is not affected by this warranty. Warranty claims will only be accepted if the purchased product has been used for its intended purpose. Any purchased product used for an unintended purpose will not be eligible for warranty protection. For all warranty inquiries or claims please address the claim to us if the purchase was directly from us or otherwise to the dealer from which you purchased the product within a period of two months from the date on which you detected its lack of conformity with the terms of the warranty. **Please include your original proof of purchase when initiating the claim.**

Out of Warranty Repairs

In the event of a fault arising after the warranty period has expired the unit should be returned to Solid State Logic either directly or via your local dealer. You will be charged for the time spent on the repair (at Solid State Logic's current repair rate) plus the cost of parts and shipping. Note that no units can be accepted for repair without prior arrangement (see below).

All Returns

- No unit will be accepted for repair by Solid State Logic unless accompanied by a valid RMA (Return Material Authorisation) number, obtainable from Solid State Logic prior to shipping.
- All units should be shipped to Solid State Logic in suitable rigid packaging – Solid State Logic cannot be held responsible for any damage caused by shipping units in other packaging. In such cases Solid State Logic will return the unit in a suitable box, which you will be charged for.
- Do not include the power cable, manual or any other items – Solid State Logic can not guarantee to return them to you.

Solid State Logic

S O U N D | | V I S I O N

Visit SSL at URL: <http://www.solidstatelogic.com>

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